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FOREST INSECT SURVEY
FREMONT NATIONAL FOREST, OREGON, AND ADJACENT PRIVATE LANDS
SEASON OF 1942

by

William D. Bedard
Berkeley, California
March 15, 1943

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Forest Insect Laboratory
Berkeley, California
March 15, 1943

FOREST INSECT SURVEY
FREMONT NATIONAL FOREST, OREGON, AND ADJACENT PRIVATE LANDS
SEASON OF 1942

APPROVED BY:

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SUBMITTED BY:

W. D. Bedard
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ABSTRACT OF RESULTS

A. The 1941 Infestation (complete record)

1. Total pine timber killed on reporting area (Table 2)

a.	Number of trees	52,780
b.	Volume Bm.	33,114,000
c.	Average volume per acre	27
d.	Percent of total stand	0.33

2. Classification of infestation - low endemic

3. Primary insect - western pine beetle in ponderosa pine

4. Trend of infestation - marked decrease from 1940

B. The 1942 Infestation (partial record)

1. Primary insect - western pine beetle in ponderosa pine

2. Probable trend - unchanged or slightly greater than 1941

3. Control work recommended - none.

FOREST INSECT SURVEY
FREMONT NATIONAL FOREST, OREGON, AND ADJACENT PRIVATE LANDS
Season of 1942

The 1942 survey to determine the extent and amount of current insect infestation within the ponderosa pine stands of the Fremont National Forest and adjacent private lands was made in two separate parts this year. Messrs. John M. Whiteside and Walter J. Buckhorn of the Bureau office in Portland, Oregon, cruised the Silver Lake and Bly area plots during the summer, and the writer with Messrs. Boyd M. Adams and Clarence E. Wallace examined the remaining plots during the period from September 21 to October 7, 1942. The Klamath Falls Unit of the Weyerhaeuser Timber Company gave excellent material aid during the latter part of the survey and it is due in large part to this help that it was possible to complete the work successfully.

The survey this year completed the record of 1941 loss and secured partial 1942 loss within the reporting area. Estimates of 1941 infestation which appear in this report are based on a one-hundred percent cruise of four 640-acre and fifteen 320-acre permanent sample plots. Infestation trends were computed from these plot data and used together with previous loss records to make the general estimates for the various areas. Plot data for the Silver Lake area were supplemented by line-sample-plot and roadstrip records secured by Whiteside and Buckhorn.

Estimates of virgin timber acreage have been corrected to January 1, 1941, through cut-over records furnished by the Klamath Forest Protective Association and the U. S. Forest Service.

Results of the Survey

The survey of sample plots showed that the gross loss of ponderosa pine due to western pine beetle attack during 1941 was generally low, although quite variable in this area. Gross losses on the sample plots ranged from zero to 107 board feet per acre, or from zero to 1.10 percent of the stand, with an average of 56 board feet or 0.38 percent of the stand (Table 1). Thus the sample plot data indicated a general infestation reduction of 41 percent below the 1940 level. This reduction is, of course, not uniform over all of the area. It is to be noted that the Rock Butte and Antelope Springs plots in the Embody Unit of the Silver Lake area showed distinct increases over the previous year. These plots, however, are located near the eastern edge of the timbered area and it was found generally that the heaviest 1941 infestation was located in the fringe timber at lower elevations. Excepting these two plots, all others showed reductions varying from 30 on the Dog Lake plot to 100 percent on the Honey Creek plot.

This type of low endemic infestation is characterized by scattered single trees which are usually the more decadent individuals in the stand. These trees were usually lightly infested with the western pine beetle so that more space was available for the miscellaneous secondary beetles which are usually associated with it. As a result, there was a marked difference from the usual appearance of a Db.-infested pine when one examined beneath the bark of an infested tree.

Estimates for the entire reporting area (Table 2) indicated a gross loss of 0.33 percent of the stand in this portion of the Klamath Basin as contrasted with 0.32 percent in the Basin as a whole. Although this appears to be a rather insignificant loss, the total for the area amounts to somewhat more than 33 million board feet. On this basis, the low 1941 loss still represents an approximate quarter million dollar loss in capital assets. The distribution of this loss is again not uniform. Losses were particularly low in the Warner Mtn., Klamath Marsh, and Bonanza areas and throughout most of the Chewaucan and Dog Lake areas. (see map). Increased infestation occurred only in the fringe timber of the Embody unit in the Silver Lake area, but these increases were not sufficiently great to represent an alarming percentage of the stand.

A somewhat different picture is presented when losses are considered in terms of net loss, because 1941 was one of the few years in the past two decades when ponderosa pine growth probably offset the insect-caused losses. It is difficult, however, to determine a net loss figure because there are no available data for ponderosa pine growth on cut-over lands, and part of the growth is offset by losses due to other agents such as wind. Considering these factors, a net gain of about 30 board feet per acre appears to be a fair estimate for 1941. It is evident at once that this net gain is quite small even during a year of very low infestation. It is, therefore, logical to assume that this rate of net gain would require a long period of time to offset the tremendous losses which occurred during the past two decades.

Infestation Trend.

The trends of the infestation for the past ten years are shown in Figure 2. These are expressed as ratios of the percent of stand killed each year compared to the percent of stand killed in 1937. Three separate curves are shown because of differences in trends for these three portions of the reporting area. Ecologically, the Chewaucan, Dog Lake, and Warner Mts. areas are much the same and the infestation trends within these areas are also similar. For the same reason, the Silver Lake and Sycan Marsh areas have been grouped as well as the Bly and Bonanza areas. All of these curves have nearly a common point for 1941, and it is evident that the 1941 infestation reached the lowest point during the decade. Indications are that the 1942 loss will be about the same or slightly greater than in 1941.

Other Insect Infestations.

An outbreak of the spruce budworm (Archips fumirerana Clem.) was reported last year on the Crane Mtn. plot in the southern portion of the Warner Mts. area. This outbreak continued in intensity during 1942 and although the boundary of the affected area has been extended but little, both the old and young fir within the infested area have been severely damaged by this insect. No actual counts were made, but it was quite apparent that a high percentage of the twig tips had been killed on most of the trees.

A similar small local outbreak of the spruce budworm was found this year on the Thomas Creek plot in the southern portion of the Chewaucan area. This outbreak apparently started in 1942 and the damage this year has been as great as in the Crane Mt. area.

It is impossible to predict the damage which may result from these outbreaks. Unlike most of the western insects belonging to this general group of leaf-feeders, an outbreak of the spruce budworm does not usually die out in two or three years. If the twig injury continues in its present intensity for another season or two, there will be a considerable tree mortality among the firs within the infested area.

Control Recommendations

No control work is recommended within this area at the present time, neither for the western pine beetle nor the spruce budworm. The western pine beetle infestation is generally low and there are no small local areas of high concentration. Similarly, the spruce budworm outbreaks, although epidemic, are confined to small areas. In addition, fir is the only tree species being injured and if some tree mortality occurs, it will probably prove beneficial in providing a release for the pine reproduction which is present in the understory.

At the present time most of the high hazard ponderosa pine stands of the Fremont National Forest and adjacent private lands have been cut over or logging is now progressing rapidly in these stands, particularly high hazard stands of the Bly Area. The Silver Lake Area is the one remaining area of this reporting unit where extensive virgin stands of high hazard still remain. Sanitation-salvage cutting of the high risk trees on this area would be highly desirable as a protective measure. Unless this can be done, or until these stands are reached with normal logging operations, this area should be closely watched for signs of increasing beetle activity and control measures should be applied whenever these become necessary.

Table 1: Pine timber killed by bark beetles on virgin sample plots - Fremont National Forest and adjacent private lands.

Area & Unit	Plot	CHECK PLOTS: Timb'd. Acreage	CHECK PLOTS: Vol. of pine	LOSS FOR 1941: No. of trees	LOSS FOR 1941: Volume b.m.	LOSS FOR 1941: b.m. per acre	LOSS FOR 1941: Percent of stand	LOSS FOR 1941: Ratio to previous year
SILVER LAKE								
Embody	Rock Butte	320	5,619,500	22	31,660	99	0.56	2.36
	Antelope Spring	320	3,980,930	20	27,410	86	0.69	1.66
	Oatman Flat	245	2,658,466	19	17,350	71	0.65	0.45
	Embody Mill	320	4,316,960	43	28,870	90	0.67	0.67
	Total	1,205	16,575,356	104	105,290	87	0.63	1.28
Silver Cr.	Thompson Res.	270	2,024,815	30	22,350	83	1.10	0.49
	Rodman Peak	320	4,779,019	15	20,080	63	0.42	0.53
	Total	590	6,803,834	45	42,430	72	0.62	0.50
SYCAN MARSH								
Hager	Sherlock	320	4,769,085	11	14,190	44	0.30	0.36
Currier Camp	Currier	320	5,839,615	19	18,150	57	0.31	0.52
Merrit Cr.	Shake Butte	620	11,618,845	32	39,910	64	0.34	0.38
	Total	1,260	22,227,545	62	72,250	57	0.32	0.41
ELY								
Meryl Cr.	Meryl Springs	640	8,564,132	56	50,670	79	0.59	0.59
	North Sprague	640	9,999,795	72	68,640	107	0.69	0.64
	Total	1,280	18,563,927	128	119,310	93	0.64	0.61
CHEWAUCAN								
Thomas Cr.	Thomas Cr.	320	4,716,007	2	3,080	10	.06	0.44
Chewaucan	Taylor	320	3,456,787	4	1,490	5	.04	.03
Coleman	South Flat	320	4,327,567	26	21,990	69	0.51	0.41
	Total	960	12,500,361	32	26,560	27	0.21	0.33
WARNER MT.								
Drake Peak	Honey Creek	200	5,255,650	0	0	0	0	0
Crane Mt.	Crane Mt.	320	7,010,715	3	6,030	19	.08	0.39
	Total	520	12,266,365	3	6,030	11	0.04	0.20
DOG LAKE								
Dog Lake	Dog Lake	320	4,116,722	4	9,220	29	0.22	0.70
Plateau	Bear Valley	290	3,200,740	3	3,350	12	0.10	0.19
	Total	610	7,317,462	7	12,570	20	0.17	0.46
BONANZA								
Goodlowe	Goodlowe	600	7,973,265	15	10,640	18	0.13	0.22
	Grand Total	7,025	104,228,615	396	395,080	56	0.38	0.59

Table 2: Insect-caused pine depletion -
Fremont National Forest and adjacent private lands.

Area & Unit	PINE TYPE				ESTIMATED 1941 LOSS				
	Virgin	Cut-over	Total acres	Total M b.m.	No.of trees	Volume M.b.m.	No. trees per section	b.m. per acre	Percent of stand
SILVER LAKE									
Embody	57,000	1,000	58,000	578,000	5,000	4,000	55	63	0.69
Silver Cr.	71,000	0	71,000	700,000	3,000	2,900	27	40	0.41
Total	128,000	1,000	129,000	1,278,000	8,000	6,900	41	53	0.54
SYCAN MARSH									
Currier Camp	53,000	0	53,000	635,000	2,200	1,970	26	37	0.31
Hager	86,000	0	86,000	1,075,000	3,100	2,800	23	33	0.26
Summer Lake	20,000	0	20,000	130,000	1,000	600	32	30	0.46
Merrit Cr.	19,600	400	20,000	270,000	1,000	890	32	45	0.33
Total	178,600	400	179,000	2,110,000	7,300	6,260	26	35	0.30
CHEWAUCAN									
Thomas Cr.	34,000	28,000	62,000	490,000	2,100	930	22	15	0.19
Mill Flat	7,500	14,500	22,000	105,000	800	230	24	10	0.22
Swamp Cr.	34,500	1,500	36,000	290,000	1,350	740	24	21	0.26
Coleman	31,500	500	32,000	330,000	1,600	960	32	30	0.29
Chewaucan	47,000	3,000	50,000	570,000	2,300	1,310	29	26	0.23
Total	154,500	47,500	202,000	1,785,000	8,150	4,170	26	21	0.23
WARNER MT.									
Drake Peak	38,000	15,000	53,000	490,000	1,200	700	14	13	0.14
Crane Mt.	37,000	8,000	45,000	330,000	1,000	600	14	13	0.18
Total	75,000	23,000	98,000	820,000	2,200	1,300	14	13	0.16
KLAMATH MARSH									
Walker Rim	12,000	2,000	14,000	115,000	350	260	16	19	0.23
Bear Flat	58,000	0	58,000	600,000	1,400	1,260	15	22	0.21
Sugar Pine Mt.	21,500	1,500	23,000	220,000	400	400	11	17	0.18
Total	91,500	3,500	95,000	935,000	2,150	1,920	15	20	0.20

Table 2 (continued): Insect-caused pine depletion -
Fremont National Forest and adjacent private lands.

Area & Unit	PINE TYPE				ESTIMATED 1941 LOSS				
	Virgin	Cut-over	Total acres	Total M b.m.	No. of trees	Volume M b.m.	No. trees per section	b.m. per acre	Percent of stand
BONANZA									
Swan Lake	4,000	59,000	63,000	50,000	2,000	100	20	2	0.20
Hildebrand	200	22,800	23,000	5,000	600	12	17	1	0.24
Rock Canyon	4,000	14,000	18,000	35,000	400	85	19	5	0.24
Royston	5,000	15,000	20,000	65,000	500	120	16	6	0.18
Goodlow	9,000	1,000	10,000	85,000	250	136	16	13	0.16
Gerber	1,800	1,200	3,000	12,000	90	35	18	3	0.29
Willow Flat	3,000	18,000	21,000	40,000	600	71	18	3	0.18
Bryant Mt.	6,000	11,000	17,000	45,000	450	100	17	6	0.22
Stukel Mt.	2,000	1,000	3,000	5,000	90	15	18	5	0.30
Total	35,000	143,000	178,000	340,000	4,980	674	18	4	0.20
BLY									
Meryl Cr.	46,000	5,000	51,000	607,000	5,500	3,950	69	77	0.65
Deming Cr.	18,200	5,800	24,000	190,000	2,000	1,180	53	49	0.62
Whitworth	18,600	8,400	27,000	258,000	1,700	1,110	40	41	0.43
Owens	12,400	11,600	24,000	165,000	2,000	1,000	53	42	0.61
Horsefly	18,000	13,000	31,000	110,000	2,500	770	52	25	0.70
Total	131,800	44,200	177,000	1,600,000	13,700	8,010	49	45	0.50
DOG LAKE									
Plateau	12,700	800	13,000	74,000	300	220	15	17	0.30
Barnes Valley	24,000	1,000	25,000	333,000	1,000	860	26	34	0.26
Four Mile	20,000	0	20,000	207,000	650	585	21	33	0.28
Hay Creek	9,500	8,000	17,500	80,000	550	265	20	15	0.33
Dog Lake	40,500	5,500	46,000	416,000	2,800	1,750	39	38	0.42
Quartz Mt.	8,000	25,000	33,000	50,000	1,000	200	19	6	0.40
Total	114,700	40,300	155,000	1,160,000	6,300	3,880	26	25	0.33
Grand Total	909,100	302,900	1,212,000	10,028,000	52,780	33,114	28	27	0.33
Total Klamath Basin	1,419,660	937,830	2,357,490	16,718,935	99,985	54,879	27	23	0.32

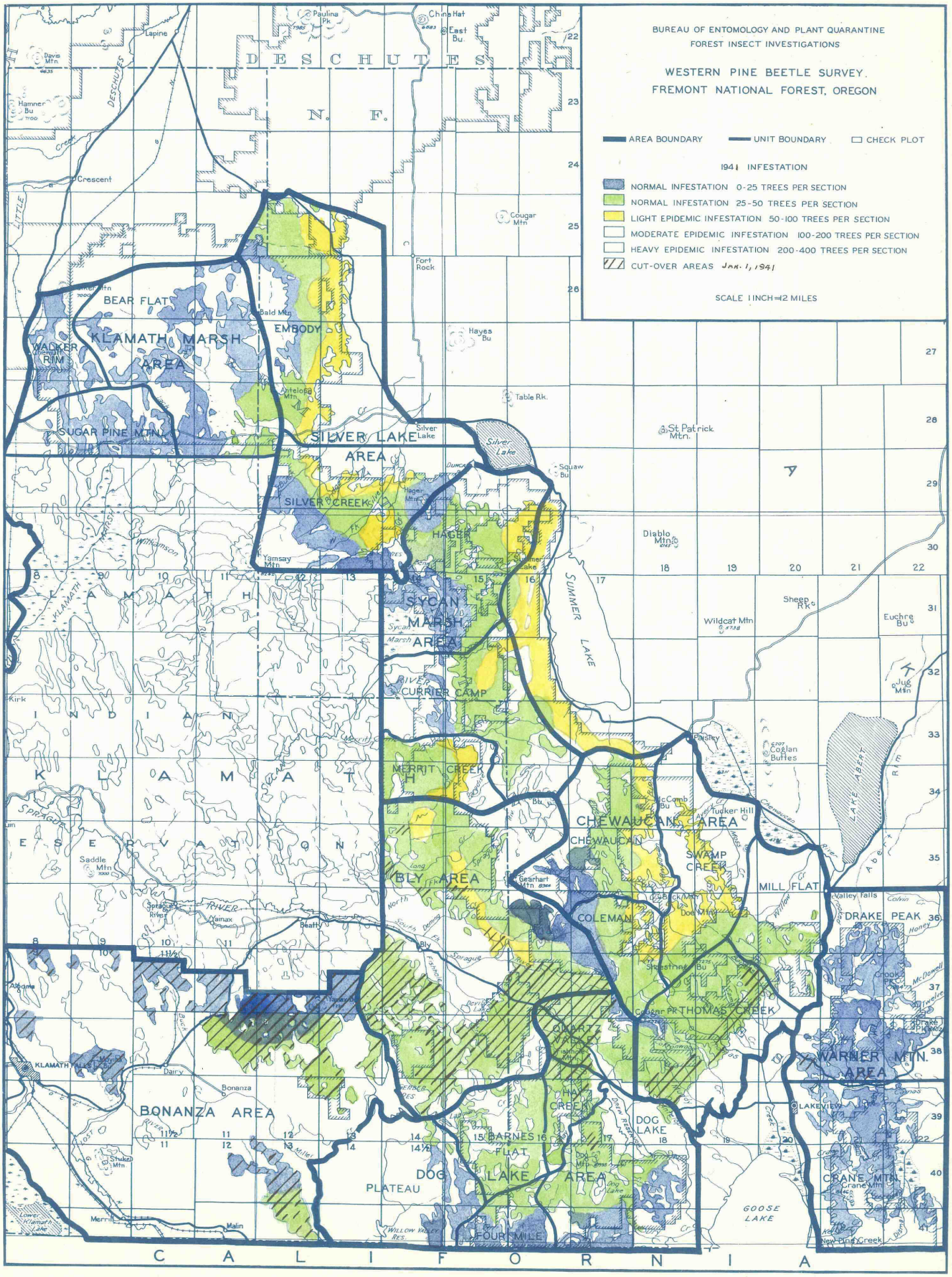
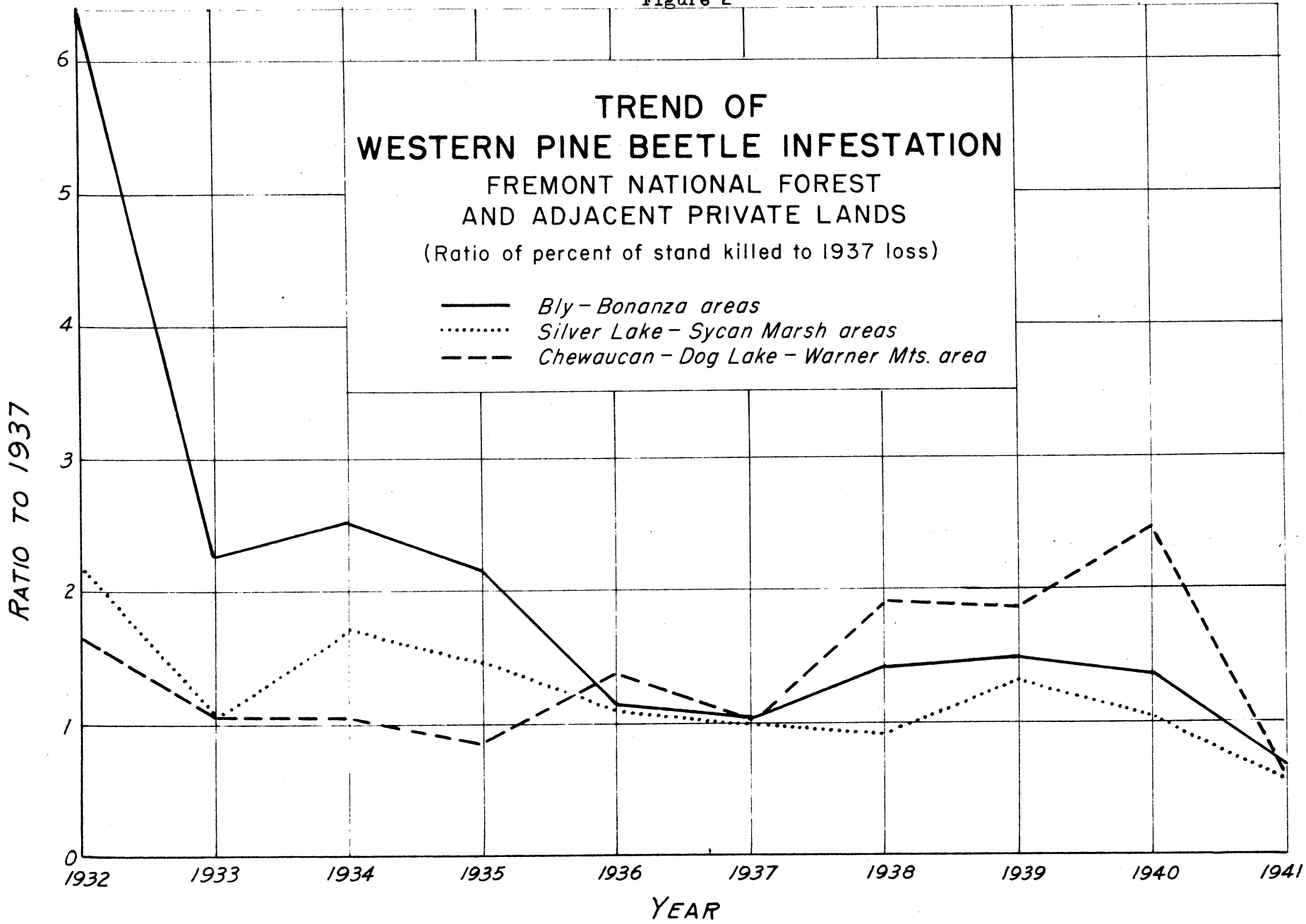

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEY.
FREMONT NATIONAL FOREST, OREGON
AREA BOUNDARY
UNIT BOUNDARY
CHECK PLOT
1941 INFESTATION
NORMAL INFESTATION 0-25 TREES PER SECTION
NORMAL INFESTATION 25-50 TREES PER SECTION
LIGHT EPIDEMIC INFESTATION 50-100 TREES PER SECTION
MODERATE EPIDEMIC INFESTATION 100-200 TREES PER SECTION
HEAVY EPIDEMIC INFESTATION 200-400 TREES PER SECTION
CUT-OVER AREAS Jan. 1, 1941
SCALE 1 INCH=12 MILES
DESCHUTES N. F.
KLAMATH INDIAN RESERVATION
CALIFORNIA
BEAR FLAT
KLAMATH MARSH AREA
WALKER RIM
EMBODY
SUGAR PINE MTN.
SILVER LAKE AREA
SILVER CREEK
HAGER
SYCAN MARSH AREA
CURRIER CAMP
MERRIT CREEK
CHEWAUCAN AREA
CHEWAUCAN
SWAMP CREEK
BLY AREA
MILL FLAT
COLEMAN
DRAKE PEAK
THOMAS CREEK
QUARTZ VALLEY
WARNER MTN. AREA
HAY CREEK
DOG LAKE
BARNES FLAT
DOG LAKE AREA
DOG PLATEAU
BONANZA AREA
KLAMATH FALLS
LAKEVIEW
CRANE MTN.
GOOSE LAKE
FOUR MILE
Paulina Pk.
China Hat
East Bu.
Lapine
Davis Mtn.
Hamner Bu.
Crescent
Cougar Mtn.
Fort Rock
Bald Mtn.
Antelope Mtn.
Table Rk.
Hayes Bu.
Silver Lake
St Patrick Mtn.
Squaw Bu.
Hager Mtn.
Yamsay Mtn.
Diablo Mtn.
Summer Lake
Wildcat Mtn.
Sheep Rk.
Euchre Bu.
Jug Mtn.
Paisley
Coglan Buttes
McComb Bu.
Tucker Hill
Gearhart Mtn.
Saddle Mtn.
Sprague River
Beatty
Yainax
Dairy
Bonanza
Stukel Mtn.
Merrill
Malin
Lower Klamath Lake
Willow Valley Res.
Crane Mtn.
New Pine Creek
Abert Lake
Summer Lake
Silver Lake
Klamath Marsh
Sycan Marsh
Sprague River
Williamson River
Deschutes River
Little Deschutes
Abert Rim

Figure 2


TREND OF
WESTERN PINE BEETLE INFESTATION
FREMONT NATIONAL FOREST
AND ADJACENT PRIVATE LANDS
(Ratio of percent of stand killed to 1937 loss)
Bly – Bonanza areas
Silver Lake – Sycan Marsh areas
Chewaucan – Dog Lake – Warner Mts. area
RATIO TO 1937
0
1
2
3
4
5
6
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
YEAR